

LIMITED ENVIRONMENTAL INVESTIGATION (LEI) REPORT

500 Flatbush Avenue
Hartford, Connecticut

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**500 Flatbush Avenue
Hartford, CT 06105**

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1.0 EXECUTIVE SUMMARY

Stantec Consulting Services Inc. (Stantec) completed a Limited Environmental Investigation (LEI) at 500 Flatbush Avenue in Hartford, Connecticut (“the Site”)(Figure 1). The report summarizes soil sampling conducted at the Site, which was conducted under the agreement between Danny Corp. (DC) and the United States Environmental Protection Agency (EPA)(Region 1) on May 30, 2013. The May 30, 2013 agreement was reached to provide EPA site characterization data as required under the Consent Agreement and Final Order (CAFO) dated September 13, 2006, as amended. The LEI report is limited in nature and does not fully satisfy the Phase III site characterization requirements of the CAFO. Notwithstanding, the LEI scope of work was developed to provide three-dimensional site characterization data for Areas of Concern (AOCs) identified in nine functional areas on Site. Functional areas include are illustrated on Figure 2.

The LEI scope of work was limited to drilling 46 borings, soil sampling at depths designated in the May 30, 2013 scope of work, the collection of 20 concrete chip samples, 9 sediment samples, and 4 hand auger samples. Samples were analyzed for Polychlorinated Biphenyls (PCBs) by EPA Method 8082 using the Soxhlet extraction procedure (EPA Method 3540C). Sampling depths were from the surface to 15 feet below grade (fbg) at the depth intervals as described in Section 5. In general depth intervals were collected at alternating foot intervals, and in some instances at more frequent and shallower intervals, depending on the functional area. For example, in the proposed roadway construction area, samples were collected continuously to five feet below grade (fbg). In the north yard where the former shredder and crane were located, samples were collected at fractional inch intervals to 0.3-inches, then 0.5-1 fbg, and then alternating foot intervals to 5 fbg. Unless otherwise specified (e.g. as above), each boring was advanced to 15 fbg to allow an evaluation of soils for compliance with the Direct Exposure Criteria (DEC) contained in the State of Connecticut Remediation Standard Regulations (the “RSRs”)(§22a-133(k), 1 through 3).

Since PCBs are characterized by extreme insolubility, it is unlikely that PCBs exceed the GB Pollutant Mobility Criteria (GB PMC) exist. Stantec analyzed ten soil samples containing the highest total PCB concentrations measured by the lab for leachable PCBs by the Synthetic Precipitate Leaching Procedure (SPLP) to validate this conclusion. Soil samples in the roadway area were also analyzed for Volatile Organic Compounds (VOCs), Polyaromatic Hydrocarbons (PAHs), 8 Resource Conservation and Recovery Act (RCRA) Metals, and Extractable Petroleum Hydrocarbons (ETPH). The analyses were added to the scope of work to evaluate other constituents of concern (COCs) that may be present from site observations. The added analyses were added to the proposed roadway functional area (functional area 8).

The Site is located in a GB area, indicating groundwater known or presumed to be degraded due to chemical leaks, spills, or land use impacts (i.e. most urban areas). Soil data were compared to the Residential DEC (RES DEC), Industrial/Commercial DEC (IC DEC), and GB PMC for PCBs of 1,000 µg/kg (1 parts per million (ppm)) and 10,000 µg/kg (10 ppm), and 0.005 mg/L (5 parts per billion)(ppb), respectively.

Soil Analytical Results

The data collected during the LEI suggest that PCBs exist at concentrations that are mostly below 10 ppm in some surficial soils at the site. Isolated areas were identified where PCBs exist above 10 ppm and include the former APS Building yard (the 1985/1986 PCB remediation

area)(based on the 2012 site characterization data collected by Stantec), soils beneath the rail siding north of the CBS Building, in the vicinity of the Overhead Crane, and soils near the former Shredder. PCBs over 50-ppm have only been detected in surficial soils near the former Shredder and Overhead Crane (Weston Solutions 2007 soil data). Most of the significantly elevated PCB concentrations detected in soils at the site appear to be associated with exposed surficial soils immediately surrounding the Overhead Crane, the former Shredder, and in the former APS Building yard where transformer cores were managed. Leachable PCB analysis (using the samples with the highest total PCB concentrations) confirms that PCBs are leachable at only trace concentrations (<0.002 mg/L) even for samples where total PCBs >50 ppm (LEI 43)(0.0-0.1-fbg). All leachable PCB concentrations were well below the GB PMC (0.005 mg/L).

The source of PCBs and petroleum that have historically entered the interceptor trench system has not yet been identified. Stantec had identified baler and crusher pits in the Main Building, which were the suspected source. However, soil borings and samples collected near the pits do not indicate significant PCB concentrations in soils in this area. While a petroleum and PAH release in this area was identified around the baler pits at the south-side of the Main Building by Weston Solutions, this release does not appear to be the source of PCBs entering the nearby interceptor trench system.

Soils in the proposed roadway samples did not identify soils containing PCBs >10 ppm. PCBs were either non-detect, <1 ppm, or just above 1 ppm in samples collected from the roadway. ETPH (e.g. petroleum hydrocarbons), PAHs, and arsenic were detected at elevated concentrations in a few samples collected from the proposed roadway. Arsenic may be naturally occurring and is often associated with soils in parts of Connecticut. Elevated ETPH and PAH concentrations that were detected in some samples may represent hot-spots or source areas. The VOCs acetone, methyl-tert butyl ether (MTBE), toluene, and trichloroethene were detected in a few soil samples, but at concentrations that are below the RES DEC, IC DEC, and GB PMC. The source of these VOCs could not be determined, but likely represent minor releases from metals managed at the Site.

A clay interface was identified across much of the Site. The clay was not encountered in some borings collected around the Main Building. Some of these borings were advanced to 20 fbg in an attempt to intersect the clay surface (since these borings depths were measured from the slab elevation and approximately 5-feet higher than surrounding grade, 20 fbg should have been an adequate depth to intersect the clay). However, the terminal depths of the borings would have been sufficient to detect significant PCB releases from the crusher and baler pits, should they exist.

Concrete Analytical Results

The concrete slab in the Main Building and APS Building contain PCBs >1 ppm but <10 ppm in some locations. As such, the concrete would be a regulated waste upon removal and disposal. Stantec proposes to re-use such concrete as granular fill as part of a redevelopment plan. A discussion of concrete re-use is presented in the redevelopment strategy section.

Sediment Analytical Results

Sediment samples collected from the drainage basin and drainage swale system was found to contain low levels of PCBs. Elevated PCB concentrations (>10 ppm) were detected in the drainage basin, and may be the result of storm water drainage to this structure. PCBs >1 ppm but <10 ppm) were measured in the stormwater outfalls located east of the south drainage yard

and APS Building yard. The depth of impacted sediment could not be determined due to the limited nature of the investigation. However, since PCBs have a strong affinity for soil and sediments, we anticipate that the depth of impacted sediment in these areas is limited to 6-inches or less. The data do not indicate that significant PCB concentrations exist in the majority of the drainage swale system nor unnamed tributary to Kane Brook.

Conceptual Site Model

Based on data collected by Weston and Stantec during our Initial Site Characterization (2011) and LEI, the data collected indicate that elevated PCB concentrations in soil are primarily associated with surficial soils, and that most PCB concentrations are below 10 ppm site-wide. Isolated areas of elevated PCBs were identified in a few areas including the shredder area, adjacent to the overhead crane runway, the former transformer management area, the APS Building, and beneath the rail siding north of the CBS Building. These isolated hot-spots include a few areas of surficial soils (e.g. adjacent to the overhead crane runway and shredder), and deeper soils (the former transformer management area south of the APS Building and beneath the rail siding north of the CBS Building). The data indicate that PCBs are mostly below analytical detection limits or at very low concentrations in soils at 15 feet across most of the Site.

The data also suggest that PCBs are not adversely impacting groundwater and are not soluble over much of the Site. However, the source of PCBs that have historically entered the interceptor trench system has not been identified. Similarly, the data do not indicate that sediment in the swale system nor Kane Brook is adversely impacted with PCBs. Isolated elevated PCB concentrations were identified in the drainage basin and nearby outfall. Since only one sample was collected from each as part of the LEI due to the limited nature of the investigation, we are not able to determine the depth and extent of impacted sediment in each. The 2007 Phase II data collected by Weston also suggest that elevated levels of PCBs exist in the drainage swale near LEI-SD3

Redevelopment Strategy

DC is selling the real estate for commercial and industrial redevelopment. Stantec has drafted conceptual strategy to address PCBs in soils under the CAFO, which may be suitable for a commercial or industrial redevelopment. Stantec's conceptual strategy requires EPA and Connecticut Department of Energy and Environmental Protection (CT DEEP) review and approval under the CAFO, 40 CFR Part 761.61, and RSRs, respectively. In addition, additional site characterization would be required site-wide in accordance with EPA requirements under the CAFO. Similarly, the site characterization must meet the CT DEEP's requirements for site characterization under the Site Characterization Guidance Document (SCGD).

Stantec has conducted preliminary discussions with Region I EPA and the CT DEEP PCBs and Underground Storage Tank (UST) Enforcement Group regarding clean-up objectives, potential remediation goals, and clean-up standards. Our proposed strategy is based on the data collected to date and those discussions. Provided that no additional data are collected to suggest that higher PCB concentrations exist elsewhere, in groundwater, or sediment, EPA and DEEP have indicated that a remediation standard for PCBs >10 ppm may be suitable for the Site under certain circumstances. For illustration purposes, Stantec has used a 50 ppm standard for PCBs in the strategy presented below. Note that the use of a standard greater than 1 ppm PCBs is subject to EPA and DEEP approval, the use of an engineered control, land use restriction, and/or structures to render soils inaccessible are also subject to DEEP and EPA

approval and not guaranteed. Under the assumptions above, Stantec proposes the following remedial strategy:

1. Completion of site characterization in accordance with State of Connecticut DEEP and prevailing standards and guidelines, DEEP's Site Characterization Guidance Document (SCGD), and EPA site characterization requirements under 40 CFR Part 761.61, Subpart N and/or CAFO requirements;
2. Source area removal of PCBs >50 ppm (crane and shredder areas);
3. Source area removal of PCBs in the shredder and crane area in shallow soils to an average depth of 3-inches (4-acres). At this depth, most PCBs are below 10 ppm;
4. Removal of PCBs >1 ppm from the drainage basin and drainage swale and outfall system (since reworking of these areas will likely occur during a redevelopment, the use of a higher standard is not likely approvable);
5. Identification and source area removal of PCBs discharging to the interceptor trench system, regardless of concentration (i.e. a continuing source of pollution);
6. In-place disposal of non-leachable PCBs (below the GM PMC by SPLP) >1 ppm and <50 ppm in remaining soils below 4 feet of clean material (either in-situ or imported fill) or 2-feet of clean material and 3-inches of asphalt pavement (areas not covered by future building). Since redevelopment activities will likely include filling most portions of the Site with 2 or more feet of clean fill to level the grade, DC anticipates that filling to the requisite depth will be part of a redevelopment plan. Thus, the strategy assumes that the placement of clean fill and pavement will occur by the developer anyway, and be part of Site development costs and not remediation.
7. In-place disposal of non-leachable PCBs (by SPLP) >1 ppm and <50 ppm beneath newly constructed buildings (as a component of sub-slab fill);
8. Removal and off-site disposal of concrete above >50 ppm (if identified);
9. Recycling existing building materials as granular fill (6-inch minus) beneath new buildings and pavement containing PCBs >1 ppm (upper limit to be determined by EPA)(most concrete samples only contain PCBs >1 ppm and < 10 ppm PCBs).
10. Application and approval of an Engineered Control (EC) Variance to leave PCBs >1 ppm and <50 ppm in place under a cap or "other structures" approved by the DEEP Commissioner.
11. Approval of the remedial strategy under 40 CFR Part 761.61(c)(risk based approval process).
12. The use of an Environmental Land Use Restriction (ELUR) to prevent disturbance of pavement, buildings, and soils below clean fill, pavement, and newly constructed structures and restrict site use to industrial/commercial uses only.
13. Use the ELUR to prevent future groundwater use for drinking water.

Note that the maximum PCB concentration that DEEP and EPA may approve for on-site disposal is subject to their discretion and may or may not be >1 or >10 ppm, depending on future Site use. Residential use typically requires remediation to <1 ppm PCBs, while industrial/commercial use (with conditions) can often use <10 ppm PCBs as a clean-up standard. The risk-based approval process contained in 40 CFR Part 761.61(c) affords the potential to use a risk-based clean-up criteria, but is not self-implementing. Similarly, approval to leave PCBs in place >1 ppm or >10 ppm is discretionary under the RSRs, and must be approved by CT DEEP. Stantec also notes that other COCs exist at the Site and include metals, petroleum hydrocarbons, and PAHs. The proposed strategy is based on the assumption that the majority of non-leachable metals, petroleum hydrocarbons, and PAHs can remain under an EC variance. While these constituents are not regulated by EPA or under the

CAFO, the State of Connecticut RSRs still apply and these constituents must be addressed as part of a site-wide redevelopment and remediation strategy.

Proposed Roadway Construction

As discussed, no significantly elevated PCB containing soils were identified beneath the proposed roadway. Most PCBs in the proposed roadway footprint (Figure 2) are below or just above 1 ppm. Elevated ETPH (petroleum) concentrations were detected in some samples. Roadway construction would disturb impacted soils in the proposed construction area. Options for managing impacted soils may include excavation and off-site disposal or management in-place under an EC variance and/or ELUR, depending on specific construction details. To manage some soils in place, the following may be required:

- A. Characterization of these areas in accordance with State of Connecticut DEEP and prevailing standards and guidelines, DEEP's SCGD, and EPA site characterization requirements under 40 CFR Part 761.61, Subpart N and/or CAFO requirements;
- B. Roadway construction would require EPA and DEEP approval to leave PCBs >1 ppm in-situ beneath the roadway under 40 CFR Part 761.61(c) and CAFO,
- C. Hot-spot removal of ETPH, PAHs, and metals above the IC DEC (e.g. 2,500 mg/kg for petroleum) and/or GB PMC (as appropriate);
- D. The approval of an EC Variance and/or ELUR by DEEP to render these materials inaccessible;
- E. The use of an ELUR to restrict site uses to industrial/commercial, specialized soil management techniques to avoid tracking or contaminants mobilization (e.g. stormwater) during construction, and
- F. The use of workers trained to work with PCB and petroleum impacted soils (i.e. Hazardous Waste Site Operations or HAZWOPER certification and experience).

2.0 BACKGROUND

The 500 Flatbush Avenue property is a 35-acre parcel located in an area of mixed commercial and industrial use on Flatbush Avenue in Hartford, Connecticut (“the Site”)(Figure 1). The northern portion of the Site (the “North Yard”) is approximately 12-acres and was used as a metal scrap yard from 1950s to 2011. The southern and central portions of the Site are approximately 23-acres and were developed during the 1960s for recycling metal turnings. From early 2011 to the present, the Site has been vacant and secured within the fenced and locked boundary of the 500 Flatbush Avenue parcel.

Historic Site operations include cutting, crushing, shredding, baling, metal identification, laboratory operations, washing, sizing, and packaging of scrap metals for recycling. Surrounding properties include an active rail line to the west, the Flatbush Avenue on/off ramps from Interstate Highway 84 (I-84) to the east, commercial (re-developed former industrial) properties to the west, and a former scaffolding company (now vacant) to the south. An elevated section of I-84 passes over the northern third of the property.

Environmental studies and several remediation projects have been conducted at the Site from the 1980s to present. Most recently, these include surficial soil sampling by Weston Solutions, Inc. (2007) across a majority of the Site to evaluate potential worker exposures to Polychlorinated Biphenyls (PCBs) in surficial soils, and a limited soil and groundwater site characterization by Stantec. The Stantec site characterization was limited in nature and designed to provide broad three-dimensional data for PCBs in soil and groundwater. The Limited Environmental Investigation (LEI) was designed to expand on these investigations and provides more detail with respect to the depth of PCBs in soils in functional areas at the Site.

3.0 INTRODUCTION

Stantec conducted Site investigation activities in order to provide limited three-dimensional site characterization data for nine functional areas on Site. The goal of the investigation was to provide additional analytical data to refine the preliminary Conceptual Site Model (CSM).

The report summarizes soil sampling conducted at the Site, which was conducted under the agreement between DC and the United States Environmental Protection Agency (EPA)(Region 1) on May 30, 2013. The May 30, 2013 agreement was reached to provide EPA site characterization data as required under the Consent Agreement and Final Order (CAFO) dated September 13, 2006, as amended. The LEI report is limited in nature and does not fully satisfy the Phase III site characterization requirements of the CAFO. Notwithstanding, the LEI scope of work was developed to provide three-dimensional site characterization data for Areas of Concern (AOCs) identified in nine functional areas on Site. Functional areas include are illustrated on Figure 2.

4.0 PRELIMINARY ACTIVITIES

Stantec retained Martin Geo Environmental (Martin) of Belchertown, Massachusetts to conduct Ground Penetrating Radar (GPR) scanning, soil boring and drilling, and concrete chip sampling. GPR and soil boring activities were conducted between June 24 and July 3, 2013. Prior to soil boring and chip sampling, Stantec contacted Call Before You Dig (CBYD) to obtain a utility clearance for all ground disturbance locations. Stantec was issued Ticket Number 20132502258.

Glassware and sampling equipment were obtained from Spectrum Analytical, Inc., a State of Connecticut certified laboratory. All glassware was pre-cleaned and certified by the manufacturer for suitability as a laboratory container. Dedicated Sterile Scoops™ were used to collect soil samples.

A Photo Ionization Detector (PID) equipped with a 10.6 lamp was pre-calibrated and rented on a weekly basis from US Environmental Rental Corporation. Daily in-field PID calibrations were conducted.

5.0 SCOPE OF WORK

The scope of work is discussed below and includes a summary of sampling activities for each functional area. Soil boring, concrete chip sampling and sediment sampling locations are presented on Figure 2. The Aerospace Parts Security (APS) Building and yard were not included in the scope because these were evaluated during the 2012 site characterization. In addition, soils in the former APS yard are known to contain PCBs >10 ppm.

1.) Crusher, Briquetting, and Separator Building (CBS)

The CBS Building was used for ferrous and non-ferrous scrap metal processing. Operations in the building included crushing, briquetting (pressure forming), and magnetic separation. According to DC, no PCB operations were conducted in this portion of the property. The yard to the east of the CBS Building was used for metals container storage (gravel). The yard to the north of the building was used for bulk scrap storage on the asphalt surface. This area was bermed and equipped with a sump for stormwater collection and discharge to the drainage swale.

- a.) Five soil borings were advanced in the outdoor storage areas to 15 fbg. Samples were collected from 0-1, 2-3, 4-5, 6-7, 8-9, 10-11, 12-13, 14-15 foot depth intervals and analyzed for PCBs by Environmental Protection Agency (EPA) Method 8082 (Soxhlet 3540C).
- b.) Two concrete chip samples were collected from stained concrete areas from 0-0.5 inches.

2.) South Drainage Yard

The south drainage yard was mostly undeveloped and used for drainage. Some trailer storage occurred in this area. The area is covered with gravel, brush, and a retention pond that was used to collect and infiltrate stormwater.

- a.) Two soil borings were advanced to 15 fbg. Samples were collected from 0-1, 2-3, 4-5, 6-7, 8-9, 10-11, 12-13, 14-15 foot depth intervals and analyzed for PCBs by EPA Method 8082 (Soxhlet 3540C).
- b.) One sediment sample was collected from the Drainage Basin and analyzed for PCBs by EPA Method 8082 (Soxhlet 3540C).
- c.) Four additional borings were advanced in this area to evaluate soils for the proposed road construction. The road construction borings are described in functional area 9.

3.) Container Storage Area (CSA)

The CSA is located west of the APS Building and Main Building (Aerospace Building). This area was used for storing containers of non-ferrous alloy, high temperature alloys, and titanium alloys for processing in the Aerospace Building. According to DC, these materials were primarily dry bulk scrap. Most metals were stored in a covered bin area, within two bermed and sheltered processing areas.

- a.) Six soil borings were advanced in the area to 15 fbg. Samples were collected from 0-1, 2-3, 4-5, 6-7, 8-9, 10-11, 12-13, and 14-15 foot depth intervals and analyzed for PCBs by EPA Method 8082 (Soxhlet 3540C).
- b.) Four additional soil borings were advanced in this area to evaluate soils for road construction. The road construction borings are described in functional area 9.

4.) Main Building (Aerospace Building)

The Aerospace Building was constructed in 1960 and used for non-ferrous metals processing, high temperature alloy, and titanium alloy processing from 1960 to 2011. Operations including chip processing using a series of chip processors; baling metals into bales; crushing using two crushers; storage and processing; and wastewater treatment using the Abcor system (1975 to 2011). AOCs in and around the Main Building include two crusher pits, two baler pits, the Abcor area, chip processing areas, and the aluminum dock and sorting tunnel where aluminum scrap was blown into rail cars using a rotary screw conveyor system.

- a.) Ten soil borings were advanced to 15 fbg near the crusher pits (3 borings), baler pits (2 borings), outside and down-gradient of the crusher pits (4 borings), and outside and down-gradient of the baler pits (1 boring). Samples were from 0-1, 2-3, 4-5, 6-7, 8-9, 10-11, 12-13, and 14-15 foot depth intervals and analyzed for PCBs by EPA method 8082 (Soxhlet 3540C).
- b.) Eight concrete chip samples were collected from stained concrete areas (0-0.5 inches) in a grid and analyzed for PCBs by EPA 8082 (Soxhlet 3540C).

5.) Overhead Crane Area

The Overhead Crane was used for transporting and loading heavy steel scrap including empty transformer steel bodies into rail cars. The area includes the crane substructure, the concrete runway, a shear and loading platform, and unpaved areas adjacent to the crane and runway. PCBs >10 ppm were detected in surficial soils by Weston in 2007. Paint on the crane was found to contain PCBs >10 µg/m³ in 2012. However, PCBs were not detected in wipe samples collected from unpainted surfaces of the crane. PCBs in paint are common and not thought to be related to Site operations. Minor concrete staining was observed on the runway surface beneath the crane. The runway concrete is in good condition.

- a.) Nine soil borings were advanced to 15 fbg near the crane/runway and adjacent unpaved areas. Samples were collected from 0-0.1, 0.1-0.2, 0.2-0.3, 0.5-1, 2-3, 4-5, 6-7, 8-9, 10-11, 12-13, and 14-15 foot depth intervals and analyzed for PCBs by EPA method 8082 (Soxhlet 3540C).
- b.) Four concrete chip samples were collected from stained concrete areas (0-0.5 inches) in a grid and analyzed for PCBs by EPA 8082 (Soxhlet 3540C).

6.) Shredder Area

The Shredder Area was used for shredding white goods, light gauge steel like appliances, lockers, and car parts, etc. These materials may have contained ballasts. Most of the PCBs deposited to soils in this area were contained in "fluff" which consisted of light materials generated by the shredder including wood, plastic, glass, paint chips, rubber, fiberglass, etc.

ballast, and capacitor cores. As a normal course of operations, the fluff was collected using four vacuum cyclones. The fluff waste was disposed off-site at local landfills. However, due to its light-weight, some of the fluff escaped the cyclones and was deposited to nearby surficial soils. As such, samples were collected from fractional inch intervals to evaluate the observation that PCBs are mostly associated with the surficial soils.

- a.) Four soil borings were advanced to 15 fbg near the shredder and former dirt walled tank areas. Samples were collected from 0-0.1, 0.1-0.2, 0.2-0.3, 0.5-1, 2-3, 4-5, 6-7, 8-9, 10-11, 12-13, and 14-15 foot depth intervals and analyzed for PCBs by EPA method 8082 (Soxhlet 3540C).
- b.) One concrete chip sample was collected from the base of the fluff bin from 0-0.5 inches in a grid and analyzed for PCBs by EPA 8082 (Soxhlet 3540C).

7.) E Building

The E building (formerly Emhart Building) was used in the 1940s through the early 1970s for glass products manufacturing. In the early 1970s, the E building was used by Suisman and Blumenthal, and later Metals Management, Inc. for chip processing, solid alloy processing (dry), titanium solids, high temperature solids, red metals (copper alloys, brass alloys), and non-ferrous metals processing from the 1970s through 2011.

Two thirds of the building (the southern section) were used for handling and processing dry, and clean red metals (e.g. brass and copper alloys), aluminum, and high temperature alloys. The remaining northern third of the building was used for processing clean, dry titanium chips, which included x-ray inspection for recycling vacuum quality titanium chips.

Scrap metals including aluminum and stainless steel were managed outside of the E-Building using “dirt-walled” tanks to form bins. The dirt walled tanks were steel underground storage tanks (USTs) that were used for liquid storage off-Site. The tanks were cut in half, sent to the Site for recycling, and used before the steel was recycled to form scrap metal bins near the E-Building. DC believes that the “tank halves” (approximately 150) were filled with soil from the Shredder Area and used to form bins. The tanks were never buried at the Site. PCBs detected in soils within the tanks in 2008 were the result of using fluff contaminated soils to fill the tank halves and not management of metals containing PCBs.

- a.) Two soil borings were advanced to 15 fbg near the E building. Samples were collected from 0-0.1, 0.1-0.2, 0.2-0.3, 0.5-1, 2-3, 4-5, 6-7, 8-9, 10-11, 12-13, and 14-15 foot depth intervals and analyzed for PCBs by EPA method 8082 (Soxhlet 3540C).
- b.) Five concrete chips samples were collected from the stained floors areas of the E Building (0-0.5-inches) and analyzed from PCBs by EPA Method 8082 (Soxhlet 3540C).

8.) Proposed Roadway

The City of Hartford is planning the construction of a roadway that connects Bartholomew Avenue with the new Flatbush Avenue off ramp. The proposed roadway is approximately 0.5 miles long and runs from Bartholomew Avenue Extension south to the former APS Building area. The depth of roadway disturbance is anticipated to be a maximum of 2.5-feet.

- a.) Eight soil borings were advanced to 5 fbg in this area. Samples will be collected from 0-1, 1-2, 3-4, 4-5 foot depth intervals and analyzed for PCBs by EPA Method 8082 (Soxhlet 3540C). In addition to PCB analysis, Volatile Organic Compounds (VOCs), PAHs, Resource Conservation and Recovery Act (RCRA) Metals, and Extractable Total Petroleum Hydrocarbons (ETPH).

9.) Drainage System

The Site has been served by a drainage system. The drainage system has historically been configured with 7 “outfalls” as illustrated on the attached plan. The “outfalls” discharge through culverts to the South Branch of the Park River or to Kane Brook, which then discharges to the South Branch of the Park River. The two interceptor trenches, installed in 1990 to intercept petroleum impacted with PCBs, discharge to the drainage system. Some sampling has been conducted in the past.

- a.) Nine sediment samples were collected from the drainage swale system. One sample will be collected near each outfall (0.3 inches) and analyzed for PCBs by EPA Method 8082 (Soxhlet 3540C).

Since PCBs are characterized by extreme insolubility, it is unlikely that exceedances of the GB Pollutant Mobility Criteria (GB PMC) exist. Stantec analyzed ten soil samples containing the highest total PCB concentrations measured by the lab for leachable PCBs by the Synthetic Precipitate Leaching Procedure (SPLP) to validate this conclusion.

All samples were analyzed by Spectrum Analytical of Agawam, Massachusetts, a State of Connecticut certified laboratory, for analysis using standardized analytical methodologies in accordance with SW846. All lab analyses were performed using the Connecticut Department of Energy and Environmental Protection’s (CT DEEP’s) Reasonable Confidence Protocols (RCPs).

6.0 SOIL SAMPLING

6.1 Soil Sampling

Soil sampling was conducted by Stantec personnel and Martin Geo Environmental, LLC of Belchertown, Massachusetts from June 24 through July 3, 2013.

Borings were drilled using a GeoProbe™ equipped with a dual-tube soil sampling system. The dual tube sampling system consists of 4-foot-long, 2.125-inch diameter threaded probe rods. An acetate sample sleeve is fitted within the lead probe rod (equipped with a hardened cutting shoe) and advanced into the subsurface. As depths increase beyond four feet below ground surface, center rods were fitted to the top of the acetate sample sleeve and an additional probe rod was added to the rod string. The assembled rod assembly is then driven an additional four feet, and sample cores are removed without removing the probe rods, allowing for a cased borehole for continued advancement and sampling. Sequentially, once the acetate sleeve was removed from the probe rod, the sleeve was cut open and immediately screened using a calibrated PID equipped with a 10.6 eV lamp. With powder free nitrile gloves and disposable sterile scoops on, soil from discrete intervals were collected from the acetate sleeve.

Soil samples are identified as LEI-1 through LEI-46. Soil samples were collected from either the interval of increased PID readings or within the designated sample interval described in the scope of work sample matrix section 5.0. Soil samples were first screened by a photoionization detector (PID) and then collected and preserved in the field in accordance with the DEEP's soil sample preservation guidelines, dated March, 2006 with deionized water and methanol (EPA Field Extraction Method 5035) for VOCs and an 8-oz. amber glass jar with a Teflon screw cap for PCBs, RCRA Metals, ETPH, and PAHs. After soil sample collection, each sample was stored on ice in a cooler. After soil sampling was completed, the soil samples were transferred under Chain of Custody and transported by a Spectrum courier for analytical analysis. The soil samples were analyzed for either PCB's by EPA Method 8082 (Soxhlet extraction method 3540C), VOCs by EPA Method 8260C, PAHs (Acid extractable) by SW846 Method 8270C and Total Metals by EPA Method 6000/7000.

Glassware and sampling equipment were obtained from a State of Connecticut certified laboratory in preparation for soil collection. Glassware used for the project was pre-cleaned and certified by the manufacturer for suitability as a laboratory container. Labels and Chain of Custody documents were obtained from the certified laboratory and deemed suitable for environmental sampling and analysis.

Soil boring locations are presented on Figure 2.

6.2 Soil Boring Recovery

Poor sample recovery was encountered in some borings and samples, thus limiting the volume of soil available for sampling. The limited soil volume prevented collection of selected sample intervals proposed in the work plan for some sample depths at some locations. The following borings and sample intervals exhibited poor recovery where no samples could be collected.

Soil Boring ID	Sample Interval Loss
LEI-11	(12-13)
LEI-15	(0-1) (2-3)
LEI-21	(8-9) (10-11) (12-13) (14-15)
LEI-22	(8-9) (10-11) (12-13) (14-15)
LEI-27	(2-3) (3-4) (4-5)
LEI-34	(4-5) (6-7)
LEI-42	(4-5) (6-7)
LEI-43	(2-3)
LEI-45	(1-2)

6.3 Soil Geology

Soil on Site generally consists of a brown to light brown-colored medium coarse sand and gravel with some crushed rock (trap-rock) to about 4 fbg followed by a grayish tan-colored clay at approximately 2 to 4 feet in the southern portion of the Site to approximately 5-15 feet located within the middle portion of the Site to the north. In most of the soil borings, following the sand and gravel layer, a very fine sand, silt, and clay is encountered composed of well sorted, thin layers of alternating silt and clay, or thicker layers of very fine sand and silt. Rhythmically bedded silt and clay varves (lake-bottom deposits) were also encountered. The varves indicate glacial lake sediment deposits. Based on the clay depth, consistency of varves, and region, the Site is situated on top of the former glacial Lake Hitchcock.

Soil was screened in the field during drilling and sampling using visual observation, olfactory observations, and a calibrated Photoionization Detector (PID) equipped with a 10.6 eV lamp. The boring location, depths, field observations, and observed depth to clay are summarized in the following table. Copies of field notes are attached as Appendix B.

Soil Boring ID	Functional Area	Visual Contamination (Olfactory) with PID Reading (PPM)	Depth (fbg)	Depth to Clay (fbg)
LEI-3	CBS Building Area	Dark stained clay with petroleum odor some medium to fine sand with brick fragments PID 6.6	5-15	8
LEI-4	CBS Building Area	Dark stained sand and clay with petroleum odor, metal shards, pieces of wood, crushed rock PID 12	5-15	4 to 8 and 13-15
LEI-6	South Drainage Yard	Dark stained sand and clay with machine oil odor PID 0	5-15	10
LEI-8	South Drainage Yard/Proposed Roadway	Dark stained sand and clay with some wood debris and machine oil odor PID 0	3-10	6
LEI-13	Container Storage Area	Dark stained sand and clay with crushed rock, black silty sand, wood debris machine oil odor PID 0	0-15	5
LEI-14	Container Storage Area	Dark stained sand and clay with crushed rock and machine oil odor PID 0	0-2	2
LEI-16	Container Storage Area/Proposed Roadway	Dark stained sand and clay, black silty sand, and machine oil odor PID 0	4-6	6
LEI-18	Main Building	Dark stained sand and clay and machine oil odor PID 0	0-15	Not Encountered
LEI-19	Main Building	Brown and gray sand and gravel and crushed rock with machine oil odor PID 0 (boring advanced to 20 fbg in attempt to reach clay)	0-20	Not Encountered
LEI-20	Main Building	Brown and gray sand and gravel and crushed rock with machine oil odor PID 0	0-15	Not Encountered
LEI-28	Proposed Roadway	Brown and gray sand and gravel and crushed rock some brick debris PID 0	0-8	8
LEI-29	Proposed Roadway	Brown and gray sand and gravel and crushed rock some wood debris PID 0	0-8	5
LEI-40	Overhead Crane Area	Brown sand and gravel with metal pieces followed by dark grey black sand and gravel and machine oil odor PID 0	0-5	5
LEI-39	Overhead Crane Area	Petroleum Stain sheen black stain and grey sand with fine sand PID 500	3-11	11
LEI-38	Overhead Crane Area	Dark brown sand and gravel followed by dark black sand with petroleum odor and sheen PID 30	0-14	14
LEI-37	Overhead Crane Area	Intermittent Brown sand with Dark black sand and fine sand some metal pieces some wood debris machine oil odor PID 20	0-14	14
LEI-34	Overhead Crane Area	Black sand and gravel machine oil odor and sheen PID 300	3-12	12

Soil Boring ID	Functional Area	Visual Contamination (Olfactory) with PID Reading (PPM)	Depth (fbg)	Depth to Clay (fbg)
LEI-43	Shredder Dirt Walled Tank Area	Brown sand and some fines with some metal shards followed by medium coarse black fill with brick pieces PID 0	0-10	10
LEI-44	Shredder Dirt Walled Tank Area	Dark stained sand and gravel some metal shards PID 17	2-7	7
LEI-45	Proposed Roadway	Dark brown sand and gravel with crushed rock followed by grey silt sand machine oil odor PID 0	0-5	5
LEI-35	Overhead Crane Area	Dark sand and fine sand with crushed rock machine oil odor PID 0	0-5	6
LEI-36	Overhead Crane Area	Dark stained sand with metal shards and machine oil odor PID 0	0-3	3
LEI-41	Overhead Crane Area	Dark stained sand and gravel with metal shards and crushed rock petroleum odor machine oil odor PID 30	0-5	6
LEI-32	E Building	Dark stained sand and gravel machine oil odor PID 0	1.5-8	8
LEI-30	Shredder Dirt Walled Tank Area	Dark stained sand with fine sand some machine oil odor PID 0	0-4	4
LEI-31	Shredder Dirt Walled Tank Area	Dark stained sand with gravel and some fine sand	0-3.5	3.5
LEI-21	Main Building (Inside)	Brown Sand and gravel medium coarse very sweet old odor PID 50 concrete refusal at 7	0-7	Not Encountered
LEI-23	Main Building (Inside)	Brown sand and gravel medium coarse very strong odor followed by grey fine silt sand very strong odor PID 0	0-8	8
LEI-22	Main Building (Inside)	Brown sand and gravel medium coarse some wood debris very strong odor followed by grey fine silt sand very strong odor PID 1 concrete refusal at 7	0-7	Not Encountered

7.0 SOIL ANALYTICAL RESULTS

Soil analytical results are discussed by functional area. Soil data was compared to the State of Connecticut Remediation Standard Regulation's §22a-133(k), Residential Direct Exposure Criteria (RES DEC) of 1,000 µg/kg and Industrial/Commercial Direct Exposure Criteria (IC DEC) of 10,000 µg/kg for total PCB's. In addition to the RES DEC and IC DEC, 10 soil samples were submitted for synthetic precipitate leachate procedure laboratory analysis (SPLP) for PCBs. All SPLP analyses were compared to the GB Pollutant Mobility Criteria (GB PMC) 0.005 mg/L for PCBs.

A select number of soil samples collected in the roadway were also analyzed for PAHs, ETPH, RCRA Metals, and VOCs. The samples were compared to the RES DEC and IC DEC. Leachable analyte results are discussed in this section as appropriate.

Soil data tables 1-9 summarize data by functional area. Soil analytical reports are provided in Appendix A.

Most PCBs detected were Aroclor 1248, Aroclor 1254, and Aroclor 1260. Aroclor 1248 is mostly associated with hydraulic fluids, plasticizers, resins, and adhesives, while Aroclors 1254 and 1260 are associated with electrical equipment. However, Aroclor mixtures were common, and drawing conclusions about releases based on the presence or absence of a particular Aroclor is speculative.

1.) Crusher, Briquetting, and Separator Building (CBS)

A total of 5 soil borings (LEI-1 through LEI-5) were advanced to approximately 16 fbg around the building footprint of the CBS Building. The 5 soil borings produced 40 samples. Seventeen (17) of the 40 samples contained PCBs. Of the 17 samples, 3 contained PCBs at concentrations exceeding the RES DEC. Samples LEI-4 (4-5) and LEI-4 (12-3) both contained PCBs at concentrations of 1,322 µg/kg (1.322 ppm) and 1,890 µg/kg (1.890 ppm), respectively. Sample LEI-3 (10-11) contained the highest concentration of PCBs within this area at a concentration of 10,300 µg/kg (10.3 ppm). PCBs exceeded the RES DEC and IC DEC at LEI-4 (4-5) and LEI-4 (12-3).

In addition to PCB analysis, soil sample LEI-3 (12-13) was sampled for PAH's because staining and strong odors were noted at this depth. Benzo(a)anthracene (9,010 µg/kg), Benzo(a)pyrene (7,310 µg/kg), Benzo(b)fluoranthene (6,270 µg/kg), and Benzo(g,h,i)perylene (3,140 µg/kg), were detected in the sample at concentrations above the RES DEC and IC DEC.

2.) South Drainage Yard

A total of 2 soil borings (LEI-6, and LEI-9) were advanced to approximately 15 fbg in the south drainage yard. The 2 soil borings produced 16 samples. Seven (7) of the 16 samples contained PCBs. Of the 7 samples, only two samples contained PCBs at concentrations exceeding the RES DEC. Samples LEI-6 (2-3) and LEI-6 (4-5) both contained PCBs at concentrations 2,595 µg/kg (2.595 ppm) and 1,433 µg/kg (1.433 ppm), respectively.

In addition to PCB analysis, soil samples LEI-9 (0-1), (2-3), and (4-5) were analyzed for PAH's. PAHs were not detected in these samples.

In addition to the two soil borings sampled in the south drainage yard, four borings were advanced in this area to evaluate soils for the proposed road construction. The results are presented in the proposed road construction section (functional area 8).

3.) Container Storage Area

A total of 6 soil borings (LEI-10 through LEI-15) were advanced to approximately 15 fbg in the container storage area. The 6 soil borings produced 45 samples. Nine (9) of the 45 samples contained PCBs. Of the 9 samples, one sample (LEI-14 (0-1)) contained PCBs above the RES DEC at a concentration of 6,420 µg/kg (6.420 ppm). Low levels of PCBs were detected in some of the other samples, but at concentrations that are below the RES DEC.

In addition to the 6 soil borings sampled in the container storage area, four borings were advanced in this area to evaluate soils for the proposed road construction. The results are presented in the proposed road construction section (functional area 8.)

4.) Main Building

A total of 10 soil borings (LEI-17 through LEI-26) were advanced to approximately 15 fbg in the Main Building and around the building footprint. The 10 soil borings produced 72 samples. Twenty-seven (27) of the 72 contained PCBs. Of the 27 samples, 7 soil samples contained PCBs at concentrations above the RES DEC. LEI-22 (0-1) contained PCBs at 1,764 µg/kg (1.764 ppm) and LEI-26 (2-3) contained PCBs at 1,234 µg/kg (1.234 ppm). For samples LEI-22 (0-1) and LEI-26 (2-3), reporting limits for each Aroclor were higher due to the sample dilution. As such, the total PCB MDL for this sample exceeded 1 mg/kg (1 ppm). Sample LEI-19 (10-11) contained PCBs at a concentration of 1,210 µg/kg (1.210 ppm) PCBs. Sample LEI-20 (6-7) contained PCBs at 1,020 µg/kg (1.020 ppm). Sample LEI-21 (0-1) and LEI-24 (8-9) contained PCBs at concentrations of 1,180 µg/kg (1.180 ppm) and 2,357 µg/kg (2.357 ppm), respectively.

5.) Overhead Crane Area

A total of 9 soil borings (LEI-34 through LEI-41) were advanced to approximately 15 fbg in the Overhead Crane area. In addition to the soil borings, 2 hand auger samples were collected in the top 6 inches of soil within the overhead crane area. The 9 soil borings and 2 hand auger samples produced 72 samples. Nineteen (19) of the 72 samples contained PCBs. Ten (10) samples exceeded the RES DEC. LEI-35 (0-1) contained 1,770µg/kg, LEI-37 (0-1) contained 3,840µg/kg, LEI-39 (0-1) contained 8,349µg/kg, LEI-40 (0-1) contained 1,801µg/kg, LEI-41 (0-1) contained 1,610µg/kg, LEI-41 (2-3) contained 2,149µg/kg, and HA-2 contained 7,310µg/kg. Of the 10 samples exceeding the RES DEC, 3 samples exceeded the RES DEC and the IC DEC for PCBs. Soil boring samples LEI-38 (0-1) and LEI-39 (2-3) contained PCBs at concentrations 32,830µg/kg and 30,130µg/kg respectively. Hand auger sample HA-1 contained PCuBs at a concentration 23,430 µg/kg.

6.) Shredder Area

A total of 4 soil borings (LEI-30, LEI-31, LEI-43, and LEI-44) were advanced to approximately 15 fbg in the Shredder Area. In addition to the soil borings, 2 hand auger samples were collected in the top 6 inches of soil within the shredder area. The 4 soil borings and 2 hand auger samples produced 45 samples. Eighteen (18) of the 45 samples contained PCBs. Twelve (12) samples contained PCB concentrations exceeding the RES DEC. Of the 12 samples containing PCBs, 3 soil samples contained PCBs exceeding the IC DEC. Soil borings LEI-43 (0.1-0.2) and LEI-44

(0.1-0.2) contained PCB concentrations of 10,018 µg/kg (10.018 ppm) and 19,840 µg/kg (19.840 ppm), respectively. The third soil boring LEI-43 (0.0-0.1) contained PCBs over 50,000µg/kg (50 ppm), at a concentration of 57,410 µg/kg (57.410 ppm).

7.) E Building

A total of 2 soil borings (LEI-32 and LEI-33) were advanced to approximately 15 fbg in the E Building area. The 2 soil borings produced 16 samples. Of the 16 samples, three contained low levels of PCBs. LEI-32 (0-1) contained PCBs at 94.4 µg/kg (0.0944 ppm), LEI-33 (0-1) contained PCBs at 569 µg/kg (0.569 ppm), and LEI-33 (4-5) contained PCBs at 80.1 µg/kg (0.0801 ppm). PCBs were below the RES DEC in samples collected around the E Building.

8.) Proposed Roadway

A total of 8 soil borings (LEI-7, LEI-8, LEI-16, LEI-27, LEI-28, LEI-29, LEI-45, LEI-46) were advanced to approximately 5 fbg in the proposed roadway area. The proposed roadway also runs through several different functional areas.

For reporting purposes, data collected from the various functional areas is discussed in a separate functional area for the proposed roadway because the roadway may be constructed before site development. The 8 soil borings produced 36 samples. Nineteen (19) of the 36 samples contained PCBs. Seven (7) samples contained PCBs exceeding the Res DEC. Sample LEI-45 (0-1) contained PCBs at 2,690 µg/kg (2.690 ppm), LEI-16 (4-5) contained PCBs at 2,490 µg/kg (2.490 ppm), LEI-8 (0-1) contained PCBs at 1,051 µg/kg (1.051 ppm), LEI-16 (3-4) contained PCBs at 1,130 µg/kg (1.130 ppm), LEI-29 (3-4) contained PCBs at 1,395 µg/kg (1.395 ppm), LEI-29 (4-5) contained PCBs at 1,258 µg/kg (1.258 ppm), and LEI-46 (0-1) contained PCBs at 1,642 µg/kg (1.642 ppm). PCBs in these samples were above the RES DEC, but below the IC DEC.

In addition to PCB analysis, 19 soil borings were analyzed for either PAH's, ETPH, RCRA 8 Metals, and VOCs. Soil samples LEI-8 (0-1), LEI-8 (1-2), and LEI-8 (2-3) were only analyzed for PAH's due to low sample recovery. These soil samples did not contain any PAH's.

Trichloroethene (TCE) (120 µg/kg) was detected in soil sample LEI-27 (0-1). This boring is located adjacent to a covered storage bin. The source of TCE may be a release of TCE from scrap stored in the bin.

ETPH was detected above the RES DEC (500 mg/kg), IC DEC (2,500 mg/kg), and GB PMC (2,500 mg/kg) in soil samples LEI-16 (0-1)(9,780 mg/kg), LEI-16 (1-2)(15,600 mg/kg), LEI-16 (2-3)(2,910 mg/kg), LEI-27 (0-1)(5,400 mg/kg), and LEI-28 (0-1)(10,000 mg/kg). Samples LEI-29 (0-1)(1,320mg/kg), LEI-29 (2-3)(642 mg/kg), LEI-45 (0-1)(2,410 mg/kg), and LEI-45 (2-3)(907 mg/kg) contained ETPH above the RES DEC (500 mg/kg), but below the IC DEC and GB PMC (2,500 mg/kg). All samples were above the RES DEC of 500mg/kg. 5 of the 9 ETPH containing samples were above the IC DEC of 2,500mg/kg.

PAHs were detected in 4 of the 19 soil samples. LEI-45 (0-1) contained levels of PAHs above the RES DEC (1,000 µg/kg) and IC DEC (1,000 µg/kg) including Benzo(a)anthracene (3,520 µg/kg), Benzo(g,h,i)perylene (2,850 µg/kg), and Benzo(a)pyrene (3,220 µg/kg).

Metals were detected at low concentrations in all the samples submitted for analysis. However, Arsenic was measured above the RES DEC (10 mg/kg) and IC DEC (10 mg/kg) in samples

collected from LEI-28 (2-3)(11.8 mg/kg), LEI-45 (0-1)(43.5 mg/kg), and LEI-45 (2-3)(16.4 mg/kg).

The drainage system (functional area 9) results are discussed in section 12. All concrete chip samples are discussed in Section 10.

8.0 CONCRETE CHIP SAMPLING

A total of 20 concrete chip samples were collected in the CBS Building, Main Building, Overhead Crane Runway, Shredder Fluff Bin, and E Building. Each location was marked off into 1 square meter (m²) sections by a carpenter's measuring tape. Within the marked-out location, approximately six (6) 1-inch hammer-drilled holes were applied to achieve enough sample volume for PCB analysis by EPA Method 8082 (Soxhlet 3540C). Immediately after the holes were drilled, collection of the concrete/asphalt slab was completed by using powder free nitrile gloves and disposable sterile scoops.

All chip samples were designated the unique identification name LEIC-“X”. Chip samples at each location were screened with a calibrated PID equipped with an 10.6 eV lamp and then collected and preserved in the field in accordance with the DEEP's soil sample preservation guidelines, dated March, 2006 with a 8-oz. amber glass jar with a Teflon screw cap. After chip sample collection, each sample was stored on ice in a cooler. After chip sampling was completed, the chip samples were transferred under Chain of Custody and transported to the laboratory by a courier for analysis.

Glassware and sampling equipment were obtained from a State of Connecticut certified laboratory in preparation for soil collection. Glassware used for the project was pre-cleaned and certified by the manufacturer for suitability as a laboratory container. Labels and Chain of Custody documents were obtained from the certified laboratory and deemed suitable for environmental sampling and analysis.

Chip samples were analyzed using the DEEP's RCPs. Chip sample locations are presented on Figure 2.

9.0 CONCRETE CHIP SAMPLING RESULTS

A total of 20 chip samples were collected in the concrete floors of the CBS Building, Main Building, Overhead Crane concrete pad area, concrete floor of E Building, and concrete floor of Shredder Fluff Bin. The results are discussed by building area.

CBS Building

Two concrete chip samples (LEI-C1 and LEI-C2) were collected from the concrete floor of the CBS building. PCBs were not detected in these samples.

Main Building

A total of 8 chip samples (LEIC-3 through LEIC-10) were collected from the concrete floor of the Main Building. Of the 8 chip samples collected, 5 contained PCBs. Four of the five samples contained PCBs above the RES DEC including LEIC-6 (1,540 µg/kg)(1.540 ppm), LEIC-7 (7,884 µg/kg (7.884 ppm), LEIC-9 (1,800 µg/kg)(1.8 ppm), and LEIC-10 (1,330 µg/kg).(1.330 ppm).

Overhead Crane Area

A total of 4 chip samples, LEIC-11 through LEIC-14 were collected on the Overhead Crane concrete pad (the runway). Of the four chip samples collected, two samples contained PCBs including LEIC-13 (275 µg/kg) and LEIC-14 (261 µg/kg)(0.261 ppm) at concentrations that are below the RES DEC.

E Building

A total of 5 chip samples (LEIC-15 through LEIC-19) were collected from the concrete floor of the E Building. Of the 5 chip samples, 4 contained PCBs. Chip samples LEIC-15 and LEIC-18 contained PCBs above the RES DEC (1 ppm) at 1,125 µg/kg (1.125 ppm) and 1,039 µg/kg (1.039 ppm), respectively.

Shredder Fluff Bin

One chip sample was collected within the concrete floor of the Shredder Fluff Bin. Chip sample LEIC-20 contained PCBs at 224 µg/kg (0.224 ppm) and below the RES DEC.

10.0 SEDIMENT SAMPLING

Sediment sampling was conducted in the proposed roadway where the drainage basin exists, at the stormwater outfalls, and the tributary to Kane Brook. Nine of the proposed sediment samples were collected and analyzed for PCBs using the EPA Method 8082 (Soxhlet 3540C). The tenth sample was located in the northern shredder yard drainage swale. Due to heavy vegetation growth and the property fence line, the drainage swale in this area was inaccessible. The sample is scheduled to be collected in the fall/winter months when plant vegetation has receded.

All sediment samples were given the unique identification name LEI SD-“X”. Sediment samples were collected using powder free nitrile gloves and sterile scoops. The sediment samples were collected at a depth of 0.3 inches. Sediment samples at each location were screened with a calibrated PID equipped with an 10.6 eV lamp and then collected and preserved in the field in accordance with the DEEP’s soil sample preservation guidelines, dated March, 2006 with a 8-oz. amber glass jar with a Teflon screw cap. After sediment sample collection, each sample was stored on ice in a cooler. After sampling was completed, the sediment samples were transferred under Chain of Custody and transported to the laboratory by a courier for analysis.

Glassware and sampling equipment were obtained from a State of Connecticut certified laboratory in preparation for soil collection. Glassware used for the project was pre-cleaned and certified by the manufacturer for suitability as a laboratory container. Labels and Chain of Custody documents were obtained from the certified laboratory and deemed suitable for environmental sampling and analysis.

Sediment samples were analyzed using the DEEP’s RCPs. Sediment sample locations are presented on Figure 2.

11.0 SEDIMENT SAMPLING RESULTS

A total of 9 sediment samples were conducted throughout the drainage system (functional area 9). Six (6) of the 9 sediment samples contained PCBs. Sediment samples LEI-SD3 and LEI-SD4 were collected from the outfalls east of the south drainage yard (LEI-SD3) and APS Building (LEI-SD4) and contained PCBs at 4,280 µg/kg (4.280 ppm) and 1,360 µg/kg (1.260 ppm), respectively. PCBs exceeded the RES DEC in these samples, but was below the IC DEC (10 ppm).

Sediment sample LEI-SD1 was collected from the drainage basin and contained PCBs at 22,400 µg/kg (22.4 ppm).

12.0 EQUIPMENT DECONTAMINATION

All equipment that came into contact with sample media was thoroughly decontaminated after each use to prevent sample cross-contamination. Decontamination procedures included washing equipment with a stiff bristle brush in an Alconox™ detergent solution, rinsing with potable water, followed by a pesticide grade laboratory hexane (20 ng/L impurities or less) and air drying.

At the end of the investigation, the GeoProbe™ and tooling was decontaminated on a decontamination pad in accordance with the double wash/rinse procedure contained in 40 CFR Part 761, Subpart S. Decontamination water and the decontamination pad materials were containerized for disposal in drums marked with the M_L mark, and presumed PCB waste (>50 ppm). Decontamination wastes are stored in a locked room in the Main Building before off-Site disposal.

Decontamination rinsate samples were collected from the tooling and GeoProbe™ to confirm the decontamination process. Two rinsate samples were collected using laboratory grade deionized water (DI) and certified pre-cleaned 1-liter amber glass jars with a Teflon screw cap. The two decontamination samples were identified as Decon-1 and Decon-2. DI water was poured over the decontaminated equipment and collected into the 1-liter amber glass jars. The rinsate water was then analyzed for PCBs by EPA Method 8082 (Soxhlet 3540C).

Both rinsate samples, Decon-1 and Decon-2 contained no PCBs. The rinsate samples confirm the decontamination methods were acceptable.

13.0 INVESTIGATION DERIVED WASTE

Investigation derived waste (IDW) includes gloves, sampling scoops, bowls, decontamination rinse water, polyethylene sheeting and other wastes generated during the course of sampling. The IDW drums are secured in an enclosed and locked portion of the APS Building labeled with the M_L mark. The drummed waste will be disposed according to the PCB sample concentration. An inventory list of the drums and contents is provided below.

Quantity (55-gallon Drum)	Contents	PCB Concentration (ppm)
2	Plastic Personal Protective equipment and decontamination plastic sheeting	<1 ppm
2	Decontamination rinse water	<1 ppm
1	Soil drill cuttings	<1 ppm

14.0 PRELIMINARY CONCEPTUAL SITE MODEL

Based on data collected by Weston and Stantec during our Initial Site Characterization (2011) and LEI, the data collected indicate that elevated PCB concentrations in soil are primarily associated with surficial soils, and that most PCB concentrations are below 10 ppm site-wide. Isolated areas of elevated PCBs were identified in a few areas including the shredder area, adjacent to the overhead crane runway, the former transformer management area, the APS Building, and beneath the rail siding north of the CBS Building. These isolated hot-spots include a few areas of surficial soils (e.g. adjacent to the overhead crane runway and shredder), and deeper soils (the former transformer management area south of the APS Building and beneath the rail siding north of the CBS Building). The data indicate that PCBs are mostly below analytical detection limits or at very low concentrations in soils at 15 feet across most of the Site.

The data also suggest that PCBs are not adversely impacting groundwater and are not soluble over much of the Site. However, the source of PCBs that have historically entered the interceptor trench system has not been identified. Similarly, the data do not indicate that sediment in the swale system nor Kane Brook is adversely impacted with PCBs. Isolated elevated PCB concentrations were identified in the drainage basin and nearby outfall. Since only one sample was collected from each as part of the LEI due to the limited nature of the investigation, we are not able to determine the depth and extent of impacted sediment in each. The 2007 Phase II data collected by Weston also suggest that elevated levels of PCBs exist in the drainage swale near LEI-SD3

The CSM will be further refined when additional data are available to validate the CSM and the nature and extent of PCB and other constituent releases are fully evaluated.

15.0 REDEVELOPMENT STRATEGY

15.1 Site Redevelopment

DC is selling the real estate for commercial and industrial redevelopment. Stantec has drafted conceptual strategy to address PCBs in soils under the CAFO, which may be suitable for a commercial or industrial redevelopment. Stantec's conceptual strategy requires EPA and Connecticut Department of Energy and Environmental Protection (CT DEEP) review and approval under the CAFO, 40 CFR Part 761.61, and RSRs, respectively. In addition, additional site characterization would be required site-wide in accordance with EPA requirements under the CAFO. Similarly, the site characterization must meet the CT DEEP's requirements for site characterization under the Site Characterization Guidance Document (SCGD).

Stantec has conducted preliminary discussions with Region I EPA and the CT DEEP PCBs and Underground Storage Tank (UST) Enforcement Group regarding clean-up objectives, potential remediation goals, and clean-up standards. Our proposed strategy is based on the data collected to date and those discussions. Provided that no additional data are collected to suggest that higher PCB concentrations exist elsewhere, in groundwater, or sediment, EPA and DEEP have indicated that a remediation standard for PCBs >10 ppm may be suitable for the Site under certain circumstances. For illustration purposes, Stantec has used a 50 ppm standard for PCBs in the strategy presented below. Note that the use of a standard greater than 1 ppm PCBs is subject to EPA and DEEP approval, the use of an engineered control, land use restriction, and/or structures to render soils inaccessible are also subject to DEEP and EPA approval and not guaranteed. Under the assumptions above, Stantec proposes the following remedial strategy:

1. Completion of site characterization in accordance with State of Connecticut DEEP and prevailing standards and guidelines, DEEP's Site Characterization Guidance Document (SCGD), and EPA site characterization requirements under 40 CFR Part 761.61, Subpart N and/or CAFO requirements;
2. Source area removal of PCBs >50 ppm (crane and shredder areas);
3. Source area removal of PCBs in the shredder and crane area in shallow soils to an average depth of 3-inches (4-acres). At this depth, most PCBs are below 10 ppm;
4. Removal of PCBs >1 ppm from the drainage basin and drainage swale and outfall system (since reworking of these areas will likely occur during a redevelopment, the use of a higher standard is not likely approvable);
5. Identification and source area removal of PCBs discharging to the interceptor trench system, regardless of concentration (i.e. a continuing source of pollution);
6. In-place disposal of non-leachable PCBs (below the GM PMC by SPLP) >1 ppm and <50 ppm in remaining soils below 4 feet of clean material (either in-situ or imported fill) or 2-feet of clean material and 3-inches of asphalt pavement (areas not covered by future building). Since redevelopment activities will likely include filling most portions of the Site with 2 or more feet of clean fill to level the grade, DC anticipates that filling to the requisite depth will be part of a redevelopment plan. Thus, the strategy assumes that the placement of clean fill and pavement will occur by the developer anyway, and be part of Site development costs and not remediation.
7. In-place disposal of non-leachable PCBs (by SPLP) >1 ppm and <50 ppm beneath newly constructed buildings (as a component of sub-slab fill);
8. Removal and off-site disposal of concrete above >50 ppm (if identified);

9. Recycling existing building materials as granular fill (6-inch minus) beneath new buildings and pavement containing PCBs >1 ppm (upper limit to be determined by EPA)(most concrete samples only contain PCBs >1 ppm and < 10 ppm PCBs).
10. Application and approval of an Engineered Control (EC) Variance to leave PCBs >1 ppm and <50 ppm in place under a cap or "other structures" approved by the DEEP Commissioner.
11. Approval of the remedial strategy under 40 CFR Part 761.61(c)(risk based approval process).
12. The use of an Environmental Land Use Restriction (ELUR) to prevent disturbance of pavement, buildings, and soils below clean fill, pavement, and newly constructed structures and restrict site use to industrial/commercial uses only.
13. Use the ELUR to prevent future groundwater use for drinking water.

Note that the maximum PCB concentration that DEEP and EPA may approve for on-site disposal is subject to their discretion and may or may not be >1 or >10 ppm, depending on future Site use. Residential use typically requires remediation to <1 ppm PCBs, while industrial/commercial use (with conditions) can often use <10 ppm PCBs as a clean-up standard. The risk-based approval process contained in 40 CFR Part 761.61(c) affords the potential to use a risk-based clean-up criteria, but is not self-implementing. Similarly, approval to leave PCBs in place >1 ppm or >10 ppm is discretionary under the RSRs, and must be approved by CT DEEP. Stantec also notes that other COCs exist at the Site and include metals, petroleum hydrocarbons, and PAHs. The proposed strategy is based on the assumption that the majority of non-leachable metals, petroleum hydrocarbons, and PAHs can remain under an EC variance. While these constituents are not regulated by EPA or under the CAFO, the State of Connecticut RSRs still apply and these constituents must be addressed as part of a site-wide redevelopment and remediation strategy.

15.2 Proposed Roadway Construction

As discussed, no significantly elevated PCB containing soils were identified beneath the proposed roadway. Most PCBs in the proposed roadway footprint (Figure 2) are below or just above 1 ppm. Elevated ETPH (petroleum) concentrations were detected in some samples. Roadway construction would disturb impacted soils in the proposed construction area. Options for managing impacted soils may include excavation and off-site disposal or management in-place under an EC variance and/or ELUR, depending on specific construction details. To manage some soils in place, the following may be required:

- A. Characterization of these areas in accordance with State of Connecticut DEEP and prevailing standards and guidelines, DEEP's SCGD, and EPA site characterization requirements under 40 CFR Part 761.61, Subpart N and/or CAFO requirements;
- B. Roadway construction would require EPA and DEEP approval to leave PCBs >1 ppm in-situ beneath the roadway under 40 CFR Part 761.61(c) and CAFO,
- C. Hot-spot removal of ETPH, PAHs, and metals above the IC DEC (e.g. 2,500 mg/kg for petroleum) and/or GB PMC (as appropriate);
- D. The approval of an EC Variance and/or ELUR by DEEP to render these materials inaccessible;
- E. The use of an ELUR to restrict site uses to industrial/commercial, specialized soil management techniques to avoid tracking or contaminants mobilization (e.g. stormwater) during construction, and

- F. The use of workers trained to work with PCB and petroleum impacted soils (i.e. Hazardous Waste Site Operations or HAZWOPER certification and experience).

16.0 DATA QUALITY

Stantec developed data quality criteria for the investigation and reviewed the data with respect to the data quality needs, objectives, and standards. The data quality review was performed to ensure that the data is suitable for use in investigation and remediation decisions.

In general, the data collected were collected using modern data quality assurance techniques, protocols, and analytical methodologies. Based on our review, the data meet the requirements specified by the Reasonable Confidence Protocols (RCPs) and DEEP policies and guidelines.

16.1 DATA NEEDS

The following data needs were identified:

1. Determine the presence or absence of a release in each functional area.
2. Determine the horizontal and vertical distribution of contaminants in each release area.
3. Determine the volumes of environmental media impacted by each release.
4. Produce data that meet quality control criteria and the Data Quality Objectives (DQOs) established for each release area.

16.2 DATA QUALITY OBJECTIVES

DQOs required for the work include:

1. Analytical methods must be in compliance with the requirements of SW846.
2. The analytical method must be able to distinguish distinct COCs which may be present in the environment from those compounds which could be introduced by the lab or cross-contamination.
3. The data set must meet the DEEP's RCPs for data quality.
4. Analytical detection limits must be below the minimum or most stringent RSR criteria to determine that all releases at the Site meet the RSR criteria.
5. Analytical data quality must be sufficient to allow the user to distinguish interference from actual environmental contaminants.
6. Analytical data quality must be sufficient to allow the user to review and verify laboratory quality control and verify the precision, accuracy, and completeness of the data set.

The sampling completed during Site investigation activities meets these DQOs since each objective was satisfied. Stantec's review of the data package indicates that the analytical methods specified in each work scope were met, the QC data were sufficient to distinguish interference from representative data, and the lab data meet both of the quality requirements contained in SW846 and the CT DEEP's RCPs.

16.3 DATA QUALITY PARAMETERS

A data quality review requires an evaluation of data quality parameters including precision, accuracy, representativeness, completeness, and comparability.

- Stantec reviewed the data quality package provided by the lab for each data set and determined that the data meet customary quality thresholds for precision. Lab precision was measured using duplicates in many cases and STANTEC finds the data to meet our requirements for precision.
- Stantec reviewed each data package for accuracy as measured by lab QC data (blanks, Laboratory controlled Spikes/Duplicates (LCS/LCSDs), and performance evaluation samples). The method blanks, LCS/LCSDs, lab duplicates, and performance evaluation sample results meet customary accuracy requirements.
- Sample collection was completed in a manner adequate to detect and define releases, with the exception of data gaps as described below.
- Based on our review of data collection methods, sample handling, and lab sample management techniques, the data package was determined to be comparable to state-of-the-art data packages used for environmental remediation projects. Since the data meet the RCPs, the data meet the requirements for comparable data packages in Connecticut, and the quality requirements set forth by the DEEP for use under the RSRs.
- The data set collected during the investigation was deemed complete, because the number of samples collected exceeds 80-percent of those specified in the scope of work. The 80-percent threshold is a typical project completion goal used in the industry.

16.4 DATA REVIEW

Soil Data Quality Review

Seven laboratory reports were issued. Each report had secondary column reporting flags for the PCB analysis. This means the data for the analyte was reported from the secondary column. Dual-column methods (pesticides, herbicides, and PCBs) are run on instruments with two but dissimilar columns so that if there is interference on one column, the secondary column should allow the analyst to quantitate data in the range without any issue. If there are no interferences, then the higher of the two concentrations are reported. Several instances were found where second column data was used. Stantec deemed the use of this data acceptable.

In some cases the relative percent difference (RPD) calculation for the field duplicate samples did not pass the acceptance range of 0-30%. Due to the nature of PCBs in soil, especially soil contaminated with hydrocarbons, the PCB molecule has the ability to attach to the hydrocarbons and not the soil. It is possible that the duplicate samples were out of the RPD percent range because the laboratory could not analyze the same exact soil matrix of the parent sample when the duplicate sample was placed into an 8 oz. jar. Overall, out of the 17 field duplicate samples collected, 6 of the field duplicate RPDs were out of the acceptance range. Based on sample variability, we do not view variances in RPDs a significant data limitation.

16.5 DATA GAPS

Stantec reviewed the data with respect to each functional area, data needs, and DQOs to determine if any material data gaps exist which would render our decisions inappropriate or based on an incomplete understanding of the Site and CSM. Based on our review, the following data gaps were identified:

- The data are limited in nature and not designed to provide complete site characterization for the Site.
- Since large areas exist between sample locations, releases may exist between borings that cannot be detected using a limited scope of work. As such, the data may not represent the complete extent of releases at the Site. As such, broad based assumptions regarding releases at the site and the extent of releases thus far identified may not be valid.
- Deeper soil sampling is necessary beneath the Main Building where the clay interface was not encountered to confirm that a source of PCBs does not exist on the clay.
- The scope and nature of this investigation was limited and negotiated with EPA to provide some Phase III site characterization. Further site characterization is required to support the redevelopment strategy presented in this document. In addition, the collection of additional data could preclude its viability.
- Additional characterization will be required to meet the DEEP and EPA site characterization requirements under the Connecticut Transfer Act, State of Connecticut Order, and CAFO. This would include evaluation of all COCs for each AOC and determining the nature and extent of each release.
- Groundwater and sediment PCB homolog analysis is likely required to further characterize releases of PCBs to groundwater (identified south of the Main Building in 2012) and sediment. Groundwater sampling is also required in other areas where groundwater has not been adequately characterized under DEEP prevailing standards and guidelines.

STATEMENT OF LIMITATIONS

The conclusions presented in this report are professional opinions based on data described in this report. These opinions have been arrived at in accordance with currently accepted environmental industry standards and practices applicable to the work described in this report. The opinions presented are subject to the following inherent limitations:

1. This report was prepared for the exclusive use of the entity referenced in Section 1.0. No other entity may rely on the information presented in the report without the expressed written consent of Stantec. Any use of the report constitutes acceptance of the limits of Stantec's liability. Stantec's liability extends only to its client and not to any other parties who may obtain the report.
2. Stantec derived the data in this report primarily from visual inspections, examination of records in the public domain, and interviews with individuals having information about the Site. The passage of time, manifestation of latent conditions, or occurrence of future events may require further study at the Site, analysis of the data, and reevaluation of the findings, observations, and conclusions in the report.
3. The data reported and the findings, observations, and conclusions expressed in the report are limited by the scope of work. The scope of work is presented herein and was agreed to by the client.
4. Stantec's investigations present professional opinions and findings of a scientific and technical nature. The report shall not be construed to offer legal opinion or representations as to the requirements of, nor compliance with, environmental laws, rules, regulations, or policies of federal, state, or local governmental agencies.
5. The conclusions presented in this report are professional opinions based on data described in this report. They are intended only for the purpose, site location, and project indicated. This report is not a definitive study of contamination at the Site and should not be interpreted as such. An evaluation of subsurface soil and groundwater conditions was not performed as part of this investigation, unless indicated. No sampling or chemical analyses of structural materials or other media was completed as part of this study unless explicitly stated. The User should be aware that the investigation was not intended to completely identify the nature and extent of hazardous substance releases at the site (e.g. PCBs, ETPH, PAHs, Metals, or as yet unidentified hazardous substances, if any).
6. This report is based, in part, on unverified information supplied to Stantec by third-party sources (i.e. laboratory data). While efforts have been made to substantiate this third-party information, Stantec cannot guarantee its completeness or accuracy.